



North Carolina Department of Environment and Natural Resources

Division of Water Quality

Charles Wakild, P.E.

Director

Pat McCrory
Governor

John E Skvarla, III
Secretary

April 29, 2013

Mr. Jim Sumner
Environmental Testing Solutions, Inc.
P.O. Box 7565
Asheville, NC 28802-7565

Dear Mr. Sumner,

Results of the 2013 Performance Evaluation toxicity test series have been reviewed by Aquatic Toxicology Unit staff. Our Unit was also a participant in the chronic and acute *Ceriodaphnia dubia* tests, acute *Pimephales promelas* test, pH, conductivity, and hardness analyses that were performed. Following the summary of overall results, test results generated by your laboratory will be discussed.

***Ceriodaphnia dubia* chronic**

There were nine chronic *Ceriodaphnia* tests performed using Solution A following the January 2011 revision of the "North Carolina Phase II Chronic Whole Effluent Toxicity Test Procedure." The mean IC25 was 7.83% with a standard deviation of 1.63 (Figure 1). Eight of the nine laboratories met minimum quality control criteria and reported results that were within the allowable two standard deviations from the mean IC25. One laboratory reported an IC25 of >13.0% which is outside of the acceptable range.

***Ceriodaphnia dubia* acute**

There were eight acute *Ceriodaphnia* tests conducted using Solution B following the methods described in *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms*, (Fifth Edition), EPA-821-R-02-012, October 2002. The mean LC50 value was 3.99% with a standard deviation of 0.37 (Figure 2). All seven laboratories reported results that met minimum quality control criteria and were within two standard deviations of the mean LC50 value.

Environmental Sciences Section

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***Pimephales promelas* acute**

Eight laboratories conducted acute *Pimephales promelas* tests using Solution C following the methods described in *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms* (Fifth Edition), EPA 821-R-02-012, October 2002. The mean LC50 value was 19.84% with a standard deviation of 1.49 (Figure 3). All eight laboratories reported results that met minimum quality control criteria and were within two standard deviations of the mean LC50 value.

pH

There were nine pH results reported for Solutions D and E. Mean pH calculated for Solution D was 7.43 with a standard deviation of 0.04 (Figure 4). All nine laboratories reported results that were within two standard deviations of the mean pH.

For Solution E, the mean was 9.19 with a standard deviation of 0.12 (Figure 5). All nine laboratories reported results that were within two standard deviations of the mean pH.

Conductivity

There were nine conductivity results reported for each of Solutions F and G. The mean was 147.44 $\mu\text{mhos/cm}$ for Solution F, with a standard deviation of 4.28 (Figure 6). Eight of the nine laboratories reported results that were within two standard deviations of the mean conductivity. One laboratory reported a result that was outside the allowable two standard deviations from the mean conductivity value.

For Solution G the mean was 148.22 $\mu\text{mhos/cm}$ with a standard deviation of 2.68 (Figure 7). Eight of the nine laboratories reported results that were within two standard deviations of the mean conductivity. One laboratory reported a result that was outside the allowable two standard deviations from the mean conductivity value.

Hardness

There were nine total hardness results reported for Solutions H and I. Mean total hardness for Solution H was 14.88 mg/L with a standard deviation of 0.94 (Figure 8). All the laboratories reported results that were within two standard deviations of the mean hardness.

For Solution I, the mean was 44.59 mg/L with a standard deviation of 1.88 (Figure 9). All the laboratories reported results that were within two standard deviations of the mean hardness.

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Individual Lab Discussion

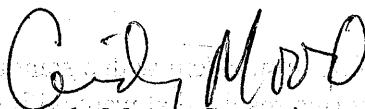
The results of the chronic and acute *Ceriodaphnia dubia*, acute *Pimephales promelas*, and pH, conductivity, and hardness analyses have been reviewed and are enclosed. The Environmental Testing Solutions, Inc.'s test results were all found to be within acceptable ranges.

Please refer to the following list to determine your respective Lab # for each enclosure.

Figure 1	<i>Ceriodaphnia</i> Chronic Solution A	Lab # 1
Figure 2	<i>Ceriodaphnia</i> Acute Solution B	Lab # 6
Figure 3	<i>Pimephales promelas</i> Acute Solution C	Lab # 8
Figures 4-9	pH, Conductivity, Hardness	Lab # 3

Thank you for your cooperation in this study. We appreciate your commitment to maintaining certification with the State of North Carolina. If you have any questions, please contact Lance Ferrell or me at (919) 743-8401.

Sincerely,


Cindy Moore, Supervisor
Aquatic Toxicology Unit

Enclosures
cc: Lance Ferrell

Figure 1: 2013 Performance Evaluation
Chronic *Ceriodaphnia dubia* IC25 Results Solution A

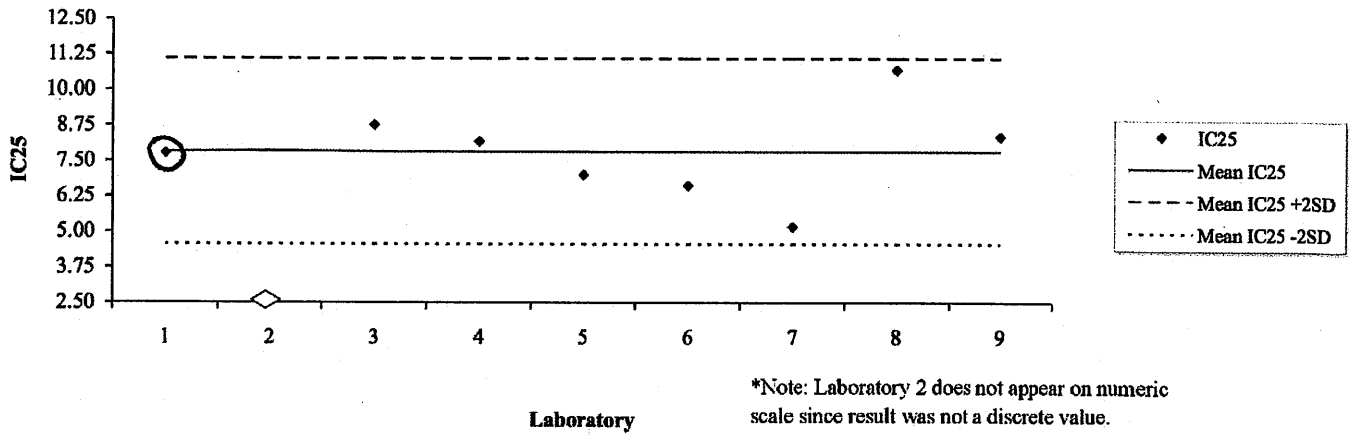


Figure 2: 2013 Performance Evaluation
Acute 48hr *Ceriodaphnia dubia* LC50 Results Solution B

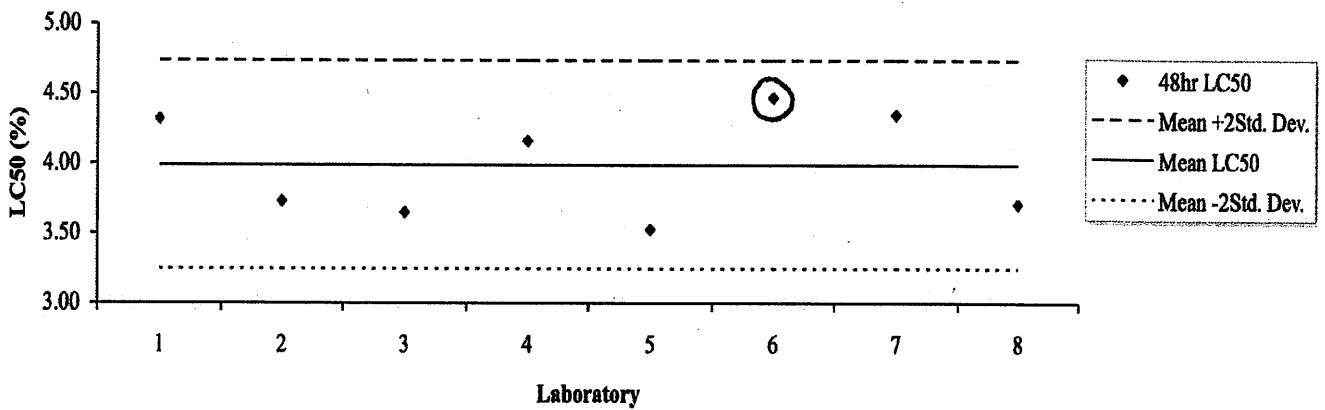
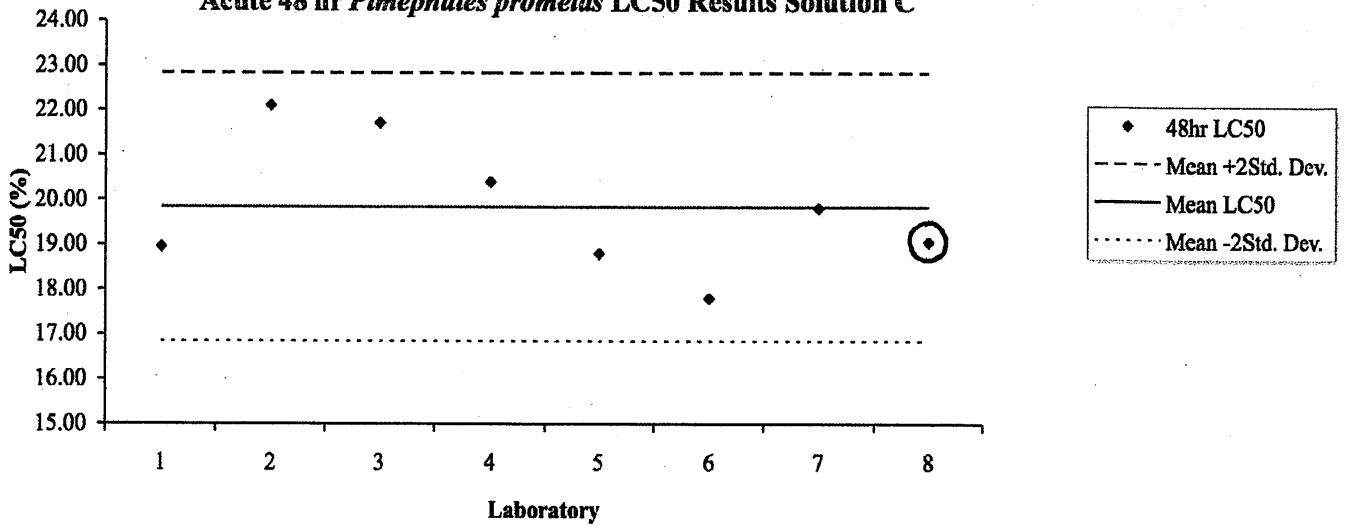
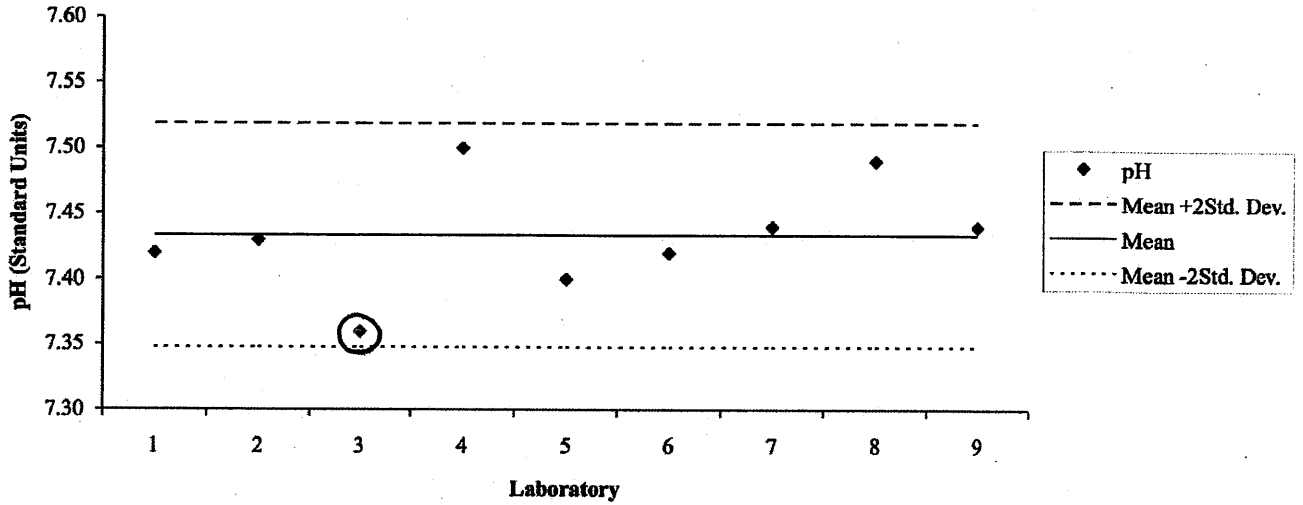


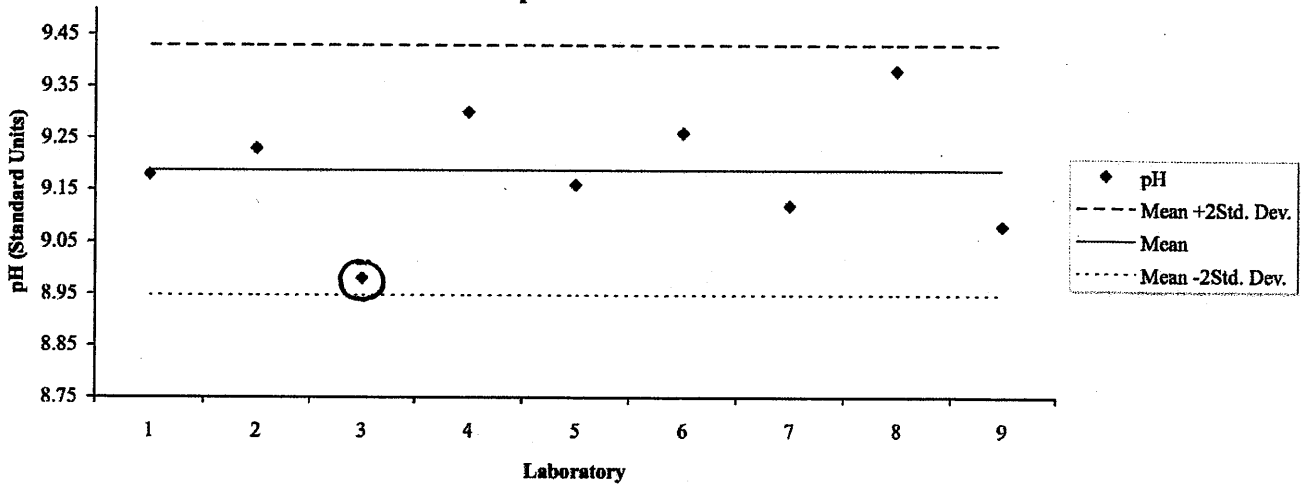
Figure 3: 2013 Performance Evaluation
Acute 48 hr *Pimephales promelas* LC50 Results Solution C



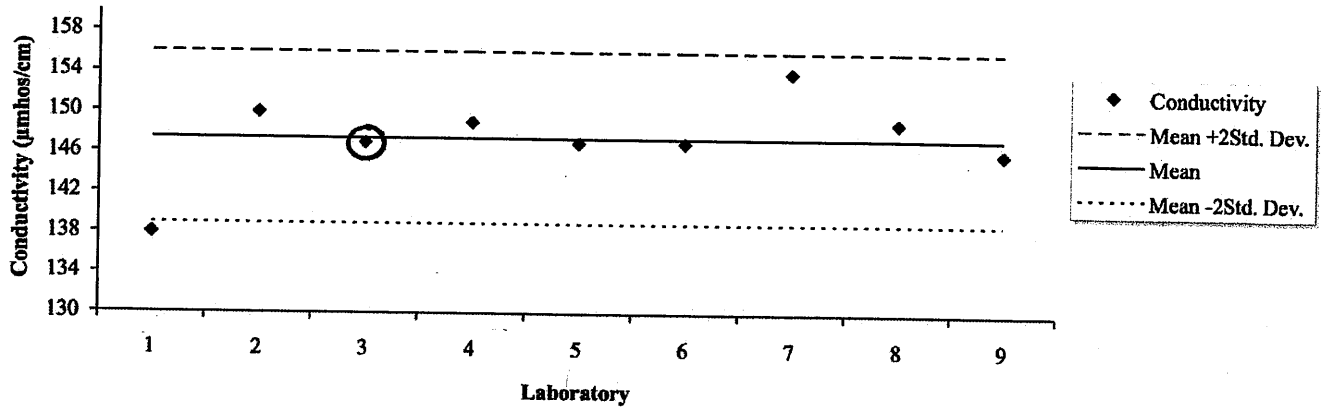
**Figure 4: 2013
Performance Evaluation
pH Results Solution D**



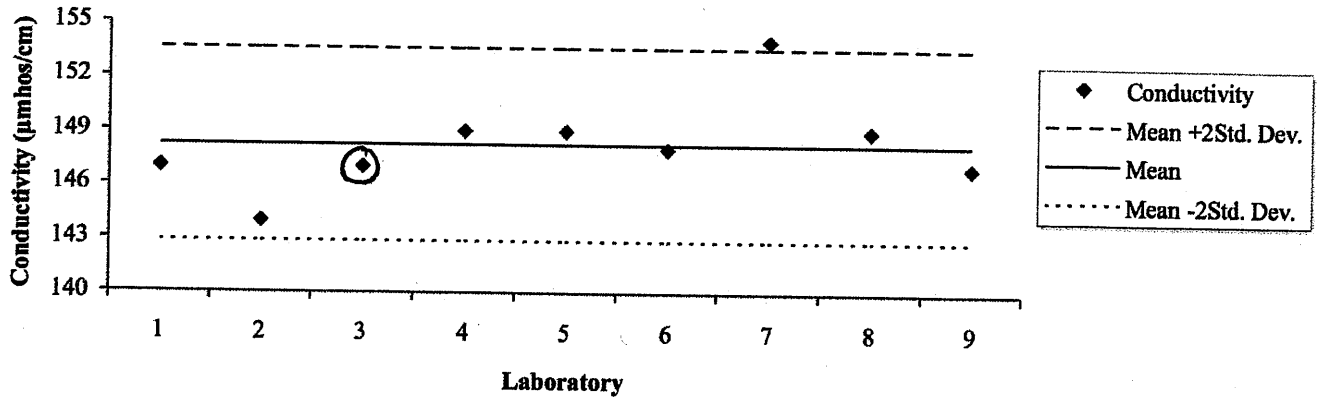
**Figure 5: 2013 Performance Evaluation
pH Results Solution E**



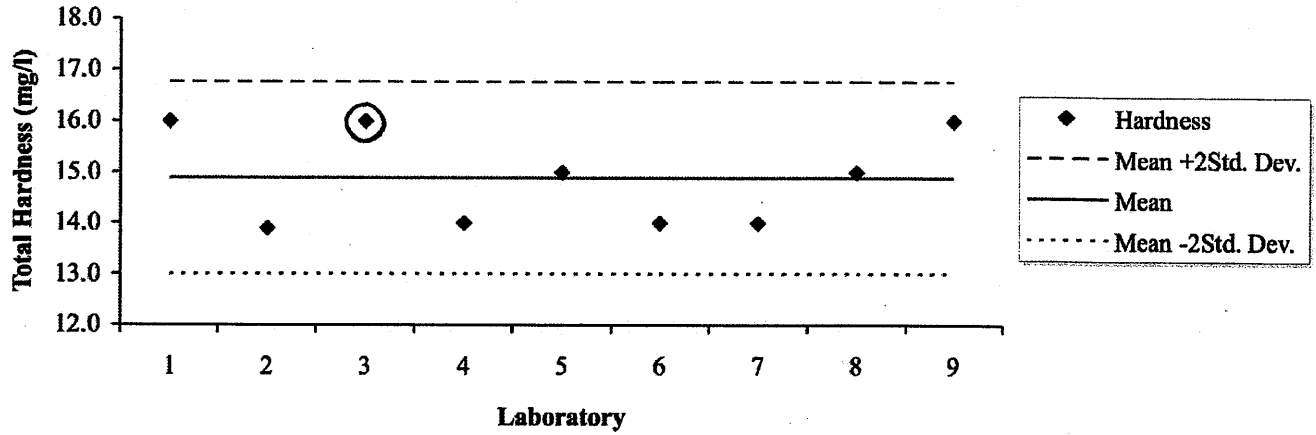
**Figure 6: 2013 Performance Evaluation
Conductivity Results Solution F**



**Figure 7: 2013 Performance Evaluation
Conductivity Results Solution G**



**Figure 8: 2013 Performance Evaluation
Hardness Results Solution H**



**Figure 9: 2013 Performance Evaluation
Hardness Results Solution I**

